

# Universal digital indicator MV31



MV31 is a universal high precision process digital indicator designed for a wide range of input sensors and signals. Five digits LED with 20mm height, allows to read the measurement values from big distant.

### Characteristic:

- Compact 150x139,60x34 mm in ABS housing
- Large 5 digit LED display with 20mm height
- Status indication by LED's at front panel
- 85...264VAC or 10...36VDC power supply
- Full configurable via function keys on front panel or by PC via RS232 interface
- Max working and storage temperature 70 °C

### Standard input/output:

- One universal analog input
- One contact digital input,
- Two Relay digital outputs with 230Vac / 3A

### Flexible digital outputs function:

- Alarm-comparing value with Hysterezis
- Limit comparing with acknowledge signal
- One shot impulse with defined width
- Time before accept comparison.

### Additional Optional modules:

- Galvanically isolated universal analog output
- Additional analog input
- RS485 Modbus RTU interface
- Two Relay digital outputs with 230Vac / 3A
- Digital isolated input module
- Sensor supply module

### Measurement Functions:

- Wide range of input signal types software configurable, 24bit resolution and high accuracy
- User defined scaling of analog inputs in two points
- Correction algorithm of measurement in one or two points
- Advance Linearization table up to 10 points, with spline interpolation in between.
- Hold function
- Tare function
- Min/max memorizing function
- Hardware and software filtering
- Special working with one or two electrochemical sensor in auto calibration mode.

### Optional Mathematic function

- Dew point [°C] in range -30°C...+30°C
- O<sub>2</sub> concentration [%] in range 10<sup>-29</sup>... 100%
- Lambda value calculation function

### Optional PC configuration software:

- "MV31-Settings" - PC based Windows 7/Vista/XP software for easy configuration and testing of MV31 device.
- Delivered with Isolated USB to RS232 converter to connect with MV31.

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## Technical Data:

- **Analog inputs** (one standard and one optional)

### 1. Thermocouple input

Type	Measuring range	Measuring accuracy	resolution*
B PtRh-Pt6%	250...1820°C	<1,5°C	0.1°C
C W5%Re-W26%Re	0...2315°C	<1°C	0.1°C
E NiCr-CuNi	-200...1000°C	<1°C	0.01°C
J Fe-CuNi	-210...1200°C	<1°C	0.1°C
K NiCr-Ni	-200...1350°C	<1°C	0.1°C
L Fe-CuNi DIN	-200...900°C	<1°C	0.01°C
M NiMo/NiCo	-50...1410°C	<1°C	0.1°C
N Nicrosil-Nisil	-200...1300°C	<1°C	0.1°C
R PtRh-Pt13%	-50...1760°C	<1°C	0.1°C
S PtRh-Pt10%	-50...1760°C	<1°C	0.1°C
T Cu-CuNi	-200...400°C	<1°C	0.01°C
Cold junction sensor	-25°C...+85°C	1,5°C	0.1°C
Temp. of ext. ambient sensor if TC is selected	100°C...+200°C	-	-

In accordance with ASTM E230-98e1, E 988-96, DIN 43710-1985, ASTM E1751

Ambient temperature sensor is included

\*Resolution is defined with 5 digits display. Real resolution is much greater.

### 2. RTD input (three or four wire connection)

Type	Measuring range	Measuring accuracy	resolution*
PT100, 3 or 4-wire	-200.0 ... 850.0 °C	0.5°C	0.01°C
PT1000, 3 or 4-wire	-200.0 ... 850.0 °C	0.5°C	0.01°C
KTY11-6	-50..150 °C	0.5°C	0.01°C
Potentiometer	0...630□	0.1%	0.001%
Potentiometer	0...5000□	0.1%	0.001%

In accordance with EN 60751

### 3. Additional analog inputs

Type	Measuring range	Measuring accuracy	resolution*
Voltage	-0.5V...+10V**	0.05%	0.1mV
Voltage	+2V	0.05%	0.1mV
Voltage	+-125mV	0.05%	10µV
Voltage	+30mV	0.2%	1µV
Current	-5mA...+25mA	0.05%	1µA
O <sub>2</sub> [%] L or O <sub>2</sub> probe	10 <sup>-29</sup> ...0.21%	1% of reading	Float point
Dew point	-30°C...+30°C	1%	0.02°C
Lambda value	0.6...10.0	0.3%	0.001°C

\*\* Range of +20V on demand

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- Analog inputs, process value

ADC Analog input resolution	24 bit
Sample period	0.5...1s
Input noise rejection (50/60Hz)	87dB
Digital filter	0...100s
Measurement correction	One or two point correction
Input impedance analog inputs	30M $\Omega$
Input impedance analog input 10V range	100K $\Omega$
Electrical isolation (analog output, RS-485, digital input, coil- contact of Relay outputs)	3000V

- **Digital inputs**

One unisolated as standard, and two isolated optional.

Those inputs can be used as control signal for special functions as Hold, Tare, Min/Max.

- **Outputs**

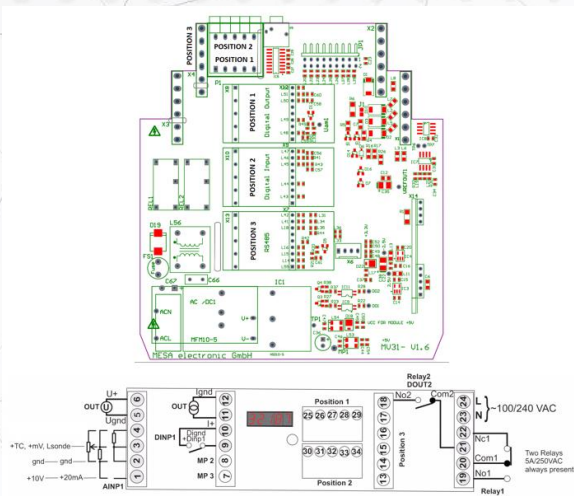
Type	Standard / option	Ratings	Max. Load	Resolution	Accuracy
Relay SPST-NO	2 standard + 2 optional	3A/250V	-	-	-
Current output	option	0mA...20mA 4mA...20mA	<400 $\Omega$	16 bit	0.2%
Voltage output	option	0V...+10V 2V...+10V	>2k $\Omega$	16 bit	0.2%
Voltage output	option*	-10V...+10V	>2k $\Omega$	16 bit	0.2%
Voltage output	option*	-1V...+1V	>200 $\Omega$	16 bit	0.2%
Voltage output	option*	-100mV...+100mV	>100 $\Omega$	16 bit	0.2%
Voltage output	option*	-25mV...+25mV	>100 $\Omega$	16 bit	0.2%
Sensor supply voltage	option	non-regulated 15V/30mA	>500 $\Omega$	-	-

\*Possible with analog output module AOM2

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**Electrical connection:**  
Screw type terminal blocks.



**Positions of optional Modules:**

- Digital Output module -> position 1
- Digital input module -> position 2
- RS485 module -> position 3
- Sensor supply module -> any position
- Analog Input module -> any position

**Interface:**

- RS232 available at the front side for connecting the device with PC.  
Needed additional accessories include:  
Isolated USB/RS232 converter, USB 2.0 Full Speed compatible, isolation voltage 2500V
- RS485/RS422 as option. Isolated interface for Modbus RTU protocol, available at the back side for connecting the device into network.

**Power supply:**

- AC 85VAC...264VAC, 50-60Hz
- OR
- DC 10VDC...36VDC

Power consumption 10VA

**Housing:**

ABS housing for front panel mounting.  
Dimensions 48x96x107

**Protection:**

- Front IP 60
- IP 65 with optional protection cab
- Back IP2

**Order number**

24809  
24820  
540-1310

**Device name**

MV31 85.....265 VAC Universal measuring amplifier  
MV31 24 VDC Universal measuring amplifier  
MV31 Universal measuring amplifier on profile rail %O2

**Additional options and accessories**

244109

A005/MV31 - configuration software with isolated USB interface